DOCUMENT RESUME

ED 217 254 CE 032 890

TITLE	Welding Tools. Pre-Apprenticeship Phase 1 Training.
INSTITUTION	Lane Community Coll., Eugene, Oreg.
SPONS AGENCY	Employment and Training Administration (DOL), Washington, D.C.; Oregon State Dept. of Education, Salem.
PUB DATE	79
NOTE	11p.; For related documents see CE 032 866-930 and ED 213 887-905.
EDRS PRICE	MF01/PC01 Plus Postage.
DESCRIPTORS	*Building Trades; Check Lists; Clothing; Equipment; *Hand Tools; Job Skills; Learning Activities; Learning Modules; Metal Working; Pacing; Postsecondary Education; Programed Instructional Materials; Tests; *Trade and Industrial Education; Two Year Colleges; *Welding
IDENTIFIERS	*Preapprenticeship Programs

ABSTRACT

This student training module on welding tools is one of three modules (see CE 032 889-891) on welding developed for Pre-Apprenticeship Phase 1 Training. (A companion instructor's guide is available separately as CE 032 888.) The modules are designed to introduce trade knowledge and skills to the student. This module contains a cover sheet listing module title, goal, and performance indicators; study guide/checklist with directions for module completion; information sheets providing details of hand tools used in welding; self-assessment; self-assessment answers; post assessment; and post-assessment answers for the instructor. Topics covered in the module include the hand tools used in welding and the proper attire that is worn in the trade. (KC)

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ED217254

INDIVIDUALIZED LEARNING SYSTEMS

PRE-APPRENTICESHIP PHASE 1 TRAINING.

WELDING TOOLS

CG009183

Goal:

The student will be able to identify and explain the use of common hand tools in the trade.

Performance Indicators:

The student will complete a Self and Post Assessment exam, demonstrating his or her knowledge.

CE032 890

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Study Guide

This guide is to be used as a "blueprint" to complete the module. Check off the following tasks as you complete them.

1. ____ Read the Goals and Performance Indicators on the cover of this module.

2. ____ Study the Information section. This will provide you with the information necessary to go on.

3. ____ Complete the Self Assessment exam and compare your answers with those on the Self Assessment Answer Sheet.

4. ____ Complete the Post Assessment exam and turn your answers in to your instructor.

Information

The welder makes use of some hand tools whenever welding is done; he or she usually supplies his or her own hand tools, which include the following:

Pliers--used to handle hot metal. These may be any style that the operator wishes.

Chipping hammer--used in arc welding to remove slag from the deposited weld materials.

Wire brushes--used by all welders to clean metal before or after welding. In arc welding, a combination wire brush and chipping hammer is commonly used.

Strikers--used in gas welding to ignite the flame. These are sometimes called sparkers or sparklighters. The cup of the striker catches the gas and allows the spark good contact with the gas for easy ignition.

Tip Cleaners--are reamers of various sizes, usually in a case. The reamer which just fits the hole in the tip is inserted in the hole and pulled in and out once or twice. This removes any carbon build-up. A small file is usually included in the cleaner case; brushing the tip's end with this file is also advisable at times.

Wrenches--there are wrenches expecially designed for removal of welding tips from the torch. Always use the proper wrench to loosen a tip. Under no circumstances should pliers be used to remove a welding tip. Pliers quickly ruin the nut on a tip as a soft brass is used, and plier pressure will distort the nut enough to cause a serious gas leak.

Welders are expected to be dressed in proper attire for safe working. Coveralls, flame retardant materials for shirts and pants, such as cotton or twill, accompanied by sensible leather foot covering, are necessary clothing. In addition to basic clothing items, some other personal equipment is usually supplied by the welder and must always be available for use. These include:

Helmet--welding helmets are necessary to protect the skin and eyes from the arc light and invisible ultraviolet and infrared rays which are extremely dangerous. The helmet has a lens through which one sees the work. This lens may be a flip-up lens so that a clear lens is available for protecting the eyes when chipping. Helmets are required in arc, MIG and TIG welding. The helmet fits over the head and swings up, out of the way, when not needed. This leaves both hands free, thereby making it possible to hold the work and weld at the same time.

Lenses--made of glass and come in different shades for different types of welding. In general, the following shades are recommended:

shade 5--gas welding and light spot welding
shade 6 or 7--gas and arc welding up to 30 amperes
shade 8--arc welding up to 75 amperes
shade 10--arc welding from 75 to 200 amperes
shade 12--arc welding from 200 to 400 amperes
shade 14--welding at over 400 amperes

A piece of clear plastic or glass called a "cover glass" is fitted over the lens to protect it from splatter. This is very inexpensive and should be replaced whenever vision is impaired. When TIG welding, the same lens selection suggestions apply.

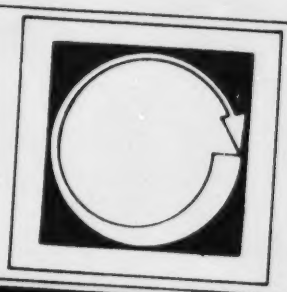
Goggles--goggles with lens shade 5 or 6 must be worn when welding or cutting with gas. Style is a personal choice. Some goggles come with a flip-up lens so that a clear lens, which rests beneath the flip-up, is available for eye protection when not welding. Clear lens goggles or their equivalent must always be worn when removing slag from a weld, grinding or other processes in which particles tend to become airborne.

Gloves--are an important item in arc welding, as they must always be worn to protect your hands from ultraviolet rays and spattering hot metal. Several kinds of gloves are available. As a rule, leather gauntlet types with enough flexibility to permit proper hand movement, provide ample protection. A thinner and more flexible glove may be used in TIG or gas welding.

Apron--may come in many styles or kinds, according to the need. These aprons are usually made of leather, and may cover only the front of the welder or be two-piece and cover the entire person. They are usually referred to as "leathers" and are hot and heavy, but offer the best protection from hot metal spatter.

Cap--any light cap worn under the helmet is adequate to protect the hair from hot metal spatter and burns.

Self Assessment



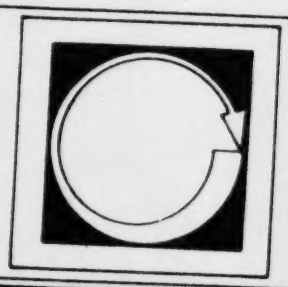
Complete each statement by writing the appropriate phrase or word in the blanks provided.

1. A _____ is used in gas welding to ignite the flame.
2. Soft _____ is used in welding tip nuts.
3. The purpose of a cap is to protect the head from _____.
4. _____ are used to clean the hole in tips.
5. The higher the amperage, the _____ the lens should be.
6. Helmets are used to protect skin and eyes from arc light, ultraviolet and _____ rays.
7. Chipping _____ are used to remove slag.

Self Assessment Answers

1. striker
2. brass
3. burns
4. tip cleaners
5. darker
6. infrared
7. hammers

Post Assessment



Select the word or phrase which correctly answers the question or completes the statement and write its corresponding letter in the blank provided.

1. ____ Which tool is used to clean metal before and after welding?
   a. wire brush
   b. striker
   c. peening hammer

2. ____ Which of the following is true of tip cleaners?
   a. come in single, standard size
   b. come in various sizes
   c. used to remove oxygen build-up

3. ____ When gas welding, one should wear a lens number:
   a. shade 5
   b. shade 1
   c. shade 20

4. ____ Goggles should be worn when:
   a. chipping
   b. climbing
   c. chatting

5. ____ _____ should be used to remove welding tips.
   a. pliers
   b. tip reamers
   c. wrenches

6. ____ Strikers or sparklighters are used in arc welding:
   a. when matches don't work
   b. never
   c. when not wearing helmets

7. ____ As a rule, _____ gauntlet gloves should be worn.
   a. asbestos
   b. leather
   c. cotton

8. ____ _____ are required in arc, MIG and TIG welding.
   a. strikers
   b. shade 5 lenses
   c. helmets

Instructor Post Assessment Answers

1. a
2. b
3. a
4. a
5. c
6. b
7. b
8. c